

# Post-Inverse-Quantization AC Prediction with a Unified Variable-Length-Decoding and Inverse-Quantization Stage

## Abstract

A motion-picture-experts group (MPEG) decoder performs AC prediction to decode first-column or first-row coefficients that are coded as differences from corresponding coefficients in a prior block or an above block. Rather than perform AC prediction between the variable-length decoder (VLD) and the inverse-quantizer (IQ), AC prediction is performed after the IQ. Post-IQ AC prediction allows the VLD and IQ to be constructed as a unified stage, improving decoding speed or efficiency as a single hardware stage can be used for the combined VLD/IQ. Rather than store prior-block quantized DCT coefficients, a coefficient store stores post-IQ DCT coefficients and quantization parameters. A Q-subtractor operates on the IQ output using the current quantization parameter, while another Q-subtractor operates on the stored coefficients and stored quantization parameter. The Q-

subtractor subtracts a signed, odd-rounded quantization parameter from a coefficient.